Sediment calculations

Posted by adehoces - 2009/08/25 16:21

Hello again! I have several questions about Kineros calculations. I am trying to calibrate Kineros in order of simulate sediment production and transport in a small basin in Spain. I am first trying to understand the calculations the program does, so I am studying the code in kinsed.for and the equations in erosion.pdf. I am a bit confused about the way the program calculates sediment concentration. I think that it gets to a certain position 'x' in the time 't', analyses the concentration coming from upland, then adds sediment from rain splash, evaluates transport capacity compared to concentration, then deposition or detachment takes place, and it goes to the following position, is that right?
I don't understand the role 'cohesion' parameter plays in equation 5. I have also problems with equation 6, I have seen it in the code but it has one 'rho' dividing there I can't understand. Can you help me?
Thanks a lot,

Ana

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Re:Sediment calculations

Posted by lainie - 2009/08/28 17:17

Hi Ana,

Answers are inserted below your questions:

I am a bit confused about the way the program calculates sediment concentration. I think that it gets to a certain position 'x' in the time 't', analyses the concentration coming from upland, then adds sediment from rain splash, evaluates transport capacity compared to concentration, then deposition or detachment takes place, and it goes to the following position, is that right?

Yes, that is correct.

I don't understand the role 'cohesion' parameter plays in equation 5.

The cohesion parameter is the cg coefficient.

I have also problems with equation 6, I have seen it in the code but it has one 'rho' dividing there I can't understand. Can you help me?

Equation 6 computes transport capacity in terms of weight of sediment per volume of water, whereas the sediment calculations in subroutine kinsed are done in terms of volume of sediment per volume of water.

Hope that helps.
Lainie

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Re:Sediment calculations
Posted by adehoces - 2009/09/09 11:50

Hello again! I still don't fully understand the role 'coh' parameter from my .par file plays in the calculations. Apart from the manual, I am also having a look at the article 'Simulation of selected events on the Catsop catchment by KINEROS2 - A report for the GCTE conference on catchment scale erosion models'. Smith, Goodrich, Unkrich. CATENA, 37, 3, 1999. In this article, they calculate hydraulic erosion following this equation, where vs is settling velocity, Cm and Cs are transport capacity and sediment concentration and Ch is a coefficient inversely related to soil cohesion. They say Ch becomes 1 if deposition takes place and otherwise it takes a value between 0 and 1. Is that right? Is this the 'coh' parameter in .par file? I am trying to find out about this because I am calibrating 'coh' and 'splash' parameters for my study basin so I need to know the values interval I can use.
Thanks a lot again,

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Re:Sediment calculations
Posted by adehoces - 2009/09/09 11:52

Sorry, could not enclose the equation, here it is:

eh= Ch * vs * (Cm - Cs)

Thanks,
Ana

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Re:Sediment calculations
Posted by lainie - 2009/09/28 23:43

Yes, you're correct. The cohesion parameter is actually a "lack of cohesion" parameter.

Lainie

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